1895MNRAS..56...66B

Invisibility of Hind's Variable Nebula (N.G.C. 1555).

By E. E. Barnard, D.Sc., A.M.

In *Monthly Notices*, No. 8, vol. lv. pp. 442–452, I have given an historical account of the variable nebulæ of Hind and Struve (N.G.C. 1555 and 1554). I have also given the observations and measures of Mr. Burnham and myself of these two objects.

I have naturally become very much interested in these nebulæ, and have taken the first favourable opportunity to examine the region again with the 36-inch.

To my surprise no trace of Hind's nebula now exists—it seems to have entirely vanished! I have examined the place of this object several mornings lately under the very best conditions, but the variable nebula could not be seen.

τ *Tauri* was identified with certainty on each occasion. To be absolutely sure of the identification I again measured its position with reference to the W.B. star $4^{h}\cdot274$ south preceding it.

1895·73 $\Delta\delta$ (τ Tauri – WB $4^{h}\cdot274$) = $+243''\cdot66$
1895·73 $\Delta\alpha$ ( ) = $+0^{m}\ 16^{s}\pm$.

I also measured the $\Delta\delta$ between the small 14^{m} star, which stands in the position assigned the Struve nebula and the W.B. star.

1895·73 $\Delta\delta$ ($14^{m}\star$ – WB $4^{h}\cdot274$) = $+189''\cdot27$.

These measures are in perfect accord with those in the article above referred to, and the identification is complete. The place was also in perfect accord with the diagrams in *Monthly Notices*, No. 8, vol. lv. pp. 444–450.

Every means was tried to see Hind's nebula: τ *Tauri* was occulted, the place was examined with averted vision, but no strain of eyesight could detect any trace of the nebula. If it had been as bright as at the observations in February last it would have been easily visible, as the conditions for seeing it were better. This proves my conjecture that this nebula still fluctuates in its light. It is certainly now invisible in the 36-inch. The place of this object should therefore receive careful attention with powerful telescopes to see when the nebula reappears.

With the utmost difficulty I could see an excessively faint star about $10''\pm$ south of the Struve star. It could not be brighter than the 17 mag., as it was at the very limit of the 36-inch. I could not be certain that this faint object was really stellar; sometimes it looked nebulous. It is impossible, however,

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to decide as to the nebulous condition of an object of this kind when at the limit of visibility.

τ Tauri was about as bright as the star A of my former paper, and seemed to be involved in a small hazy nebulosity; but the definite nebula in which it shone in 1890 did not exist.

These observations have been made under the best conditions, with the objects on the meridian, upon the following dates:—

1895 September 15, 22, and 23.

Mount Hamilton, California:
1895 *September* 24.

Note on some Remarks of Mons. O. Callandreau in the "Bulletin Astronomique" for November 1895. By E. J. Stone, M.A., F.R.S., Radcliffe Observer.

In the *Bulletin Astronomique* for November 1895, p. 458, there are some remarks by Mons. O. Callandreau, which bear upon my papers on time measurement. But as my papers on this subject have nearly all been printed in the *Monthly Notices*, it is, perhaps, desirable that the few words which I consider necessary in the way of reply should also appear in these publications.

M. Callandreau states, with perfect accuracy, that I base my measures of *t*, fundamentally, upon the Sun's mean longitude. But he expresses himself as follows:—

"On voit dans l'article dont il s'agit que M. Stone, rompant avec l'habitude des astronomes de mesurer le temps par l'angle horaire du Soleil, procède comme si la longitude moyenne du Soleil devait servir à la mesure du temps.

"Les deux manières sont également admissibles à un point de vue abstrait."

I have given this statement in M. Callandreau's own words on account of its importance.

I hardly think, however, that this statement, *as it will generally be understood*, can be accepted as correct.

If astronomers did, as a matter of fact, consistently and exclusively use a system of time-measures, *t′*, which had no connection whatever with the system of time-measures, *t*, based on the Sun's mean motion in longitude, which I employ, then it might be possible to admit that my views were mathematically sound, but of no practical importance in the existing state of astronomy. But I have proved, or profess to have proved—whether rightly or wrongly may now be taken as the real point at issue—that astronomers *use in their mathematical investigations* measures of time, *t*, based directly on the Sun's mean motion in longitude; and, if there is any change of usage, which I assert to be the case, it is they who break away from the fundamental

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